WHAT IS CLAIMED IS:

1.   A method of performing error diffusion, the method comprising the steps of:

simultaneously processing image data for at least two pixels in a row of pixels, said at least two pixels comprising a first group of pixels and a last pixel, said last pixel abutting a group of pixels to be processed next;

reducing the precision of said image data to produce a modified image data word and an error word for each pixel;

propagating a portion of said error word for each pixel in said first group to two pixels in a next row of pixels; and

propagating a first portion of said error word for said last pixel to a pixel in said next row of pixels and a second portion of said error word for said last pixel to a pixel in said group of pixels to be processed next.

2.   The method of Claim 1 further comprising the steps of:

generating a pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said first group comprises:

dividing said error word into a first and a second portion;

subtracting said pseudo random number from said first portion to produce a first modified error word;

adding said pseudo random number to said second portion to produce a second modified error word; and

adding said first and said second modified error words to image data for a first and second pixel in said next row of pixels.

3.   The method of Claim 2, where said first modified error word is added to image pixel data

for a pixel directly below the pixel generating the error signal.

4.   The method of Claim 2, where said second modified error word is added to image pixel

data for a pixel directly below and to the right of the pixel generating the error signal.

5   5.   The method of Claim 1 further comprising the steps of:

generating a pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

10   subtracting said pseudo random number from said first portion to produce a

first modified error word;

adding said pseudo random number to said second portion to produce a

second modified error word;

adding said first modified error word to image data for a pixel in said next row

15   of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

6.   The method of Claim 1 further comprising the steps of:

generating a pseudo random number; and

20   wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

adding said pseudo random number to said first portion to produce a first

modified error word;

subtracting said pseudo random number from said second portion to produce a

second modified error word;

5   adding said first modified error word to image data for a pixel in said next row

of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

7.   The method of Claim 1 further comprising the steps of:

10   generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said first group

comprises:

dividing said error word into a first and a second portion;

adding said pseudo random number to said first portion to produce a first

15   modified error word;

adding said pseudo random number to said second portion to produce a

second modified error word; and

adding said first and said second modified error words to image data for a first

and second pixel in said next row of pixels.

20   8.   The method of Claim 1 further comprising the steps of:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

adding said first pseudo random number to said first portion to produce a first

modified error word;

adding said second pseudo random number to said second portion to produce

5 a second modified error word;

adding said first modified error word to image data for a pixel in said next row

of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

10 9. The method of Claim 1 further comprising the steps of:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said first group

comprises:

dividing said error word into a first and a second portion;

15 adding said pseudo random number to said first portion to produce a first

modified error word;

subtracting said pseudo random number from said second portion to produce a

second modified error word; and

adding said first and said second modified error words to image data for a first

20 and second pixel in said next row of pixels.

10. The method of Claim 1 further comprising the steps of:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second group comprises:

dividing said error word into a first and a second portion;

adding said first pseudo random number to said first portion to produce a first modified error word;

subtracting said second pseudo random number from said second portion to produce a second modified error word;

adding said first modified error word to image data for a pixel in said next row of pixels; and

adding said second modified error word to image data for a pixel in said group of pixels to be processed next.

11. The method of Claim 1 further comprising the steps of:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second group comprises:

dividing said error word into a first and a second portion;

subtracting said first pseudo random number from said first portion to produce a first modified error word;

adding said second pseudo random number to said second portion to produce a second modified error word;

adding said first modified error word to image data for a pixel in said next row of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

12.   A display system comprising:

a controller for receiving and processing pixelated image data said controller:

5   simultaneously processing image data for at least two pixels in a row of

pixels, said at least two pixels comprising a first group of pixels and a last pixel,

said last pixel abutting a group of pixels to be processed next;

reducing the precision of said image data to produce a modified image data

word and an error word for each pixel;

10   propagating a portion of said error word for each pixel in said first group to

two pixels in a next row of pixels; and

propagating a first portion of said error word for said last pixel to a pixel in

said next row of pixels and a second portion of said error word for said last pixel

to a pixel in said group of pixels to be processed next.

15   a light source for generating a beam of light along a first light path;

a light modulator for selectively modulating light along said first light path in

response to image data signals from said controller.

13.   The display system of Claim 12, said controller:

generating a pseudo random number; and

20   wherein said propagating a portion of said error word for each pixel in said first group

comprises:

dividing said error word into a first and a second portion;

subtracting said pseudo random number from said first portion to produce a

first modified error word;

adding said pseudo random number to said second portion to produce a

second modified error word; and

5   adding said first and said second modified error words to image data for a first

and second pixel in said next row of pixels.

14.   The display system of Claim 12, said controller:

generating a pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second

10   group comprises:

dividing said error word into a first and a second portion;

subtracting said pseudo random number from said first portion to produce a

first modified error word;

adding said pseudo random number to said second portion to produce a

15   second modified error word;

adding said first modified error word to image data for a pixel in said next row

of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

20   15.   The display system of Claim 12, said controller:

generating a pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

adding said pseudo random number to said first portion to produce a first

modified error word;

subtracting said pseudo random number from said second portion to produce a

5   second modified error word;

adding said first modified error word to image data for a pixel in said next row

of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

10   16.   The display system of Claim 12, said controller:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said first group

comprises:

dividing said error word into a first and a second portion;

15   adding said pseudo random number to said first portion to produce a first

modified error word;

adding said pseudo random number to said second portion to produce a

second modified error word; and

adding said first and said second modified error words to image data for a first

20   and second pixel in said next row of pixels.

17.   The display system of Claim 12, said controller:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

adding said first pseudo random number to said first portion to produce a first

5   modified error word;

adding said second pseudo random number to said second portion to produce

a second modified error word;

adding said first modified error word to image data for a pixel in said next row

of pixels; and

10   adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

18.   The display system of Claim 12, said controller:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said first group

15   comprises:

dividing said error word into a first and a second portion;

adding said pseudo random number to said first portion to produce a first

modified error word;

subtracting said pseudo random number from said second portion to produce a

20   second modified error word; and

adding said first and said second modified error words to image data for a first

and second pixel in said next row of pixels.

19.   The display system of Claim 12, said controller:

generating a first and second pseudo random number; and

wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

5   adding said first pseudo random number to said first portion to produce a first

modified error word;

subtracting said second pseudo random number from said second portion to

produce a second modified error word;

adding said first modified error word to image data for a pixel in said next row

10   of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.

20.   The display system of Claim 12, said controller:

generating a first and second pseudo random number; and

15   wherein said propagating a portion of said error word for each pixel in said second

group comprises:

dividing said error word into a first and a second portion;

subtracting said first pseudo random number from said first portion to produce

a first modified error word;

20   adding said second pseudo random number to said second portion to produce

a second modified error word;

adding said first modified error word to image data for a pixel in said next row

of pixels; and

adding said second modified error word to image data for a pixel in said group

of pixels to be processed next.